

Prospects for Adopting System of Rice Intensification in Sri Lanka: A Socioeconomic Assessment

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Today, there is an increasing worldwide interest in assessing the potential for maintaining or increasing rice yields by reducing or eliminating the use of chemicals and by decreasing irrigation requirements. The System of Rice Intensification (SRI) first developed in Madagascar and now being tested in many countries, is an example of such an approach. The system is based largely on organic farming principles and additional requirements for spacing and the transplanting of seedlings.

The System of Rice Intensification (SRI) recently generated interest and discussions among researchers, development practitioners and policymakers in Sri Lanka. This has often resulted in polarized views. Some proponents claim that SRI will revolutionize the method of rice production, while others see it as a fad. Studies in Africa, Asia and Latin America provide mixed results. But most of these studies are anecdotal in nature or are limited to experimental and demonstration activities. Only one other study that we are aware of (conducted in Madagascar) applies an appropriate methodology that would assess the farmers' experience. This study contributes to filling this research gap using the Sri Lankan farmers' experience. The study specifically assesses the adoption pattern, economics and the poverty outreach of the SRI to generate research, extension and policy implications.

The data for the study were obtained from focus group interviews and structured questionnaire surveys conducted in the Rathnapura and Kurunegala districts of Sri Lanka. The sample farmers were selected using a two-stage stratified random sampling design. The total sample size was 120 farmers, 60 from each of the two study locations, and from each location 30 each, from SRI and non-SRI farmers. The resulting data were analyzed using descriptive statistics, econometrics of qualitative dependent variables (i.e., logit and tobit models), enterprise budgeting, and indicator-based poverty assessment tools.

There was a wide variation in the way that farmers practiced the SRI, with the majority of the adopters using the methodology on only a portion of their farms. However, as found in other studies, many farmers abandoned this method after a season or two largely because of the heavy labor requirement, which is about three times more than that of conventional rice cultivation. For example, in the SRI method transplanting requires (37 man-days per ha), weeding needs (31 man-days per ha), bund construction and cleaning necessitates (4.1 man-days per ha), and organic fertilizer collection and transportation involves (12.6 man days per ha). The corresponding figures for conventional fields are 8.1 man-days for broadcasting, 1.6 man-days for weeding, 11.4 man-days for bund construction and cleaning, and 7.3 man-days for organic matter collection and transportation. Among nonusers, 87.5 percent reported having heard about the SRI, mostly from other farmers, and of these, only 25.4 percent confirmed that they intended to practice SRI. Consistent with the practicing farmers' observations, the non-adopters reported that the major obstacle to the adoption of SRI was the high labor demand and the tedious nature of the associated management practices, such as transplanting and manual weeding.

The determinants of the adoption of SRI were identified using regression (logit) analysis. Labor availability (indicated by the size and demographic structure of the household), years of schooling, access to training

programs, farm or field location, and the poverty status of the household were the main determinants. Households with a large family size and greater labor availability were more likely to adopt SRI, which reflects SRI's higher demand for labor. There was no significant difference in adoption between farmers situated at the head of the irrigation canal and rain-fed farmers, and with farmers at the middle and tail of irrigation systems less likely to adopt SRI than the farmers in the first two categories. For rain-fed farmers, the opportunity to minimize costs from weather risks was an incentive for the adoption of SRI. In a parallel analysis of determinants of disadoption of SRI (using a logit regression model), average realized yield during the first season(s) of adoption and poverty group membership were statistically significant variables. One of the controversies surrounding the SRI is whether it is suitable for adoption by poorer households. The analysis showed that the rich and the poor farmers were equally likely to practice SRI, though for different reasons. The rich are more educated and more inclined to experiment with new methods; the poor have a more urgent need to raise the productivity of their limited land and their relatively more abundant labor. Their net benefit per hectare was somewhat less than that for richer farmers. Once they adopted SRI, the poor were more likely to continue using it.

SRI farmers in Sri Lanka reported a yield increase of 44 percent, which is lower than that reported by many other countries. Returns to crop budgets were higher even when charging a relatively high rate for labor. The cost of production per hectare was not lowered with the SRI methods. However, given that production was

significantly increased, the cost of production per unit of paddy output was considerably lower. Consequently, the estimated average profits for SRI was almost double that of conventional practice. But not all farmers registered positive profit figures. Some had net losses. The incidence of losses among the farmers adopting SRI was substantially lower than that for conventional rice cultivators. The reduction in inorganic fertilizer and other agrochemical use under SRI are environmentally beneficial factors, which only a few farmers appreciate, or are concerned with. But these societal benefits could justify public efforts to support the spread of SRI.

Thus we conclude that the System of Rice Intensification (SRI), like its closely related practices, such as organic farming, ecological farming, and low-input sustainable agriculture, is a niche production method, and without widespread adoption, there is little, if any, prospect for water saving at a system or basin level. The main avenues for making SRI more viable for rice farmers in Sri Lanka are: (1) improving the efficiency of or mechanizing the transplanting and weeding operations; (2) research into an alternative source or method of soil fertility management; and (3) improving the reliability of irrigation supply. Whether or not to pursue these avenues and promote SRI remains an open question. However, this study will provide policymakers with a realistic appraisal of the potentials and limitations of SRI in Sri Lanka. Hopefully, it will stimulate further systematic research efforts to assess the potential benefits and limitations of SRI adoption in diverse climatic and socioeconomic environments.